SATISFACTION OF THE PRE-CLINICAL STUDENTS REGARDING CURRENT ANATOMY CURRICULUM AND ANATOMY TEACHERS OF KUST INSTITUTE OF MEDICAL SCIENCES (KIMS), KOHAT

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ABSTRACT

Objectives: To assess the satisfaction of the pre-clinical students regarding anatomy curriculum for its course contents, time allocation and assessment of internal evaluation process and evaluation of anatomy teachers by students.

Material and Methods: This study was conducted from 2008-20l0 on pre-clinical students at the end of their two years anatomy course at KIMS. Students were questioned about anatomy curriculum regarding its course contents, time allocation and assessment of internal evaluation process of students. Study also included independent evaluation of anatomy teachers by Quality Enhancement Cell of Kohat University.

Results: Out of 200 students, 184 (92%) responded to questionnaire. The hour's distribution was declared as *ADEQUATE* for extremities (55%) and vertebral column/back (52%); *TOO SHORT* for embryology (51%), head & neck (50%) and *TOO LONG* for abdomen (74%), pelvis plus perineum (70%), neuroanatomy (68%) and applied anatomy (52%). Internal evaluation system was declared satisfactory by 124 (67.40%) students. Out of seven anatomy teachers evaluated by students, 3 (42.8%) were given an average score of 85.59% and 3 (42.8%) were given an average score of 78.32%. Forty one percent of the students favored for alternative methods instead of cadaveric dissection. Forty percent of the students asked for both horizontal and vertical integration of anatomy with other subjects.

Conclusion: Most of the preclinical students were satisfied with the studied course contents, internal evaluation system and teachers performance. The results underline the need for periodical revision of the anatomy curriculum based on feedback from students in order to produce better doctors.

Key Words: Anatomy Education, Undergraduate Curriculum, Preclinical Student's Feedback.

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INTRODUCTION

A curriculum is different and much more than a syllabus. It is an "attempt to communicate the essential principles and features of an educational proposal in such a form that it is open to critical scrutiny and capable of effective translation into practice".[1] Curriculum design incorporates objectives oriented course contents with teaching and learning strategies followed by assessment procedures for students and finally evaluation of the whole process by the students. In many countries, curricula of different basic medical subjects are being critically reviewed on regular basis in order to improve the quality of teaching.[2] Designing a new curriculum is really a scholarly job. Multiple discussions are needed at various steps amongst the faculty members in order to develop a new curriculum.[3,4]

Human Anatomy including gross anatomy, embryology and histology, is one of the basic subjects in the field of medicine. Its knowledge is vital for medical profession in spite of decrease in its importance due to time allocation, course contents and its position in advanced medical curriculum.[5] It is unfortunate that this subject is taught as standalone content domains without any horizontal and vertical organization of the contents with other preclinical and clinical subjects. There are two conflicting issues regarding development of curriculum in pre clinical years especially for anatomy either to increase or decrease the teaching time.[6] Although it has been exclusively reduced in most of the medical schools of USA and Europe,[7,8] anatomists are still facing a great challenge to deliver the required level of anatomical knowledge in a reduced time-frame and with fewer ways and means.[5] A recent study in USA has shown that a signifi-

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cant number of unavoidable deaths were due to inadequate anatomical knowledge of the residents.[9] This fact was also supported by another survey depicting that majority of the residents were deficient in the subject of human anatomy. Furthermore, the role of suggestions of preclinical students at the end of their course is really valuable and should be taken into consideration in updating the undergraduate curriculum.[10-13]

Cadaveric dissection had been considered mandatory since long but actually plays a small role in learning anatomy at undergraduate level[6] so has been considered optional [7] in modern anatomy curricula of many medical schools and been recently declared optional by Pakistan medical and dental council (PMDC). So it has been superseded by dissection movies, plastinated models, prosected specimens and widespread use of web-based and computer-based resources.[8,9] Furthermore problem based learning (PBL), a valuable learning aid helps to motivate the students to gain self directed learning skills.[5] It is widely practiced in most of the countries of world but unfortunately is at introductory and experimental stage in Pakistan and still the old conventional lecture system is being followed widely.

This study was conducted to assess the satisfaction of the pre-clinical students regarding current anatomy curriculum taught at KUST Institute of Medical Sciences (KIMS), Kohat about its contents along with hour's distribution and to take student's feedback suggestions for revision of curriculum along with evaluation of teachers and assessment procedure.

MATERIAL AND METHODS

This cross sectional study was carried out in the Department of Anatomy, Kohat university of Science and Technology (KUST), Institute of Medical Sciences (KIMS); Kohat, Pakistan from 2008 to 2010. It included 184 preclinical male and female students of KIMS at the end of their anatomy course. Convenient sampling method was used to collect the data. Informed consent was taken and the study was priorly approved by the ethical committee of college.

Response of students of the KIMS was taken on a specially designed questionnaire about anatomy curriculum regarding its course contents, time allocation and assessment of internal evaluation process of students during anatomy course. The anatomy course was divided into eleven sections i.e. general anatomy, histology, embryology, extremities, thorax, abdomen, pelvis/perineum, head and neck, neuroanatomy, vertebral column/back and applied anatomy. Details of the existing hour's distribution are given in Table I. Students were asked to mark the appropriate column to evaluate whether the time allocated to each section was adequate, short or too long for them. Students were also asked to recommend changes or suggestions for improvement in the existing anatomy curriculum.

PROFILE OF CURRENT ANATOMY CURRICULUM

Academic Year	Cumulative Teaching Hours	Gross Anatomy	Histology	Embryology
1st Year	250 Hours	(Total 166 Hours) General Anatomy (26 hours) Upper Limb (45 hours) Thorax (30 hours) Lower Limb (45 hours) PBL (20 hrs)	(Total 63 Hours) Lecture hours (21 Hours) Laboratory Work hours (42 Hours)	Lecture hours (21 Hours)
2nd Year	250 Hours	(Total 158 Hours) Head & Neck (35 hours) Abdomen (4o hours) Pelvis & Perineum (27 Hours) Back (10 hours) Neuroanatomy (36 hours) PBL (10 Hours)	Total (63 hours) Lecture hours (21 Hours) Lab work hours 42 Hours)	Lecture hours (29 hours)

Table I

Study also included independent evaluation of anatomy teachers by *Quality Enhancement Cell* (QEC) of Kohat University of Science and Technology (KUST) Kohat. Evaluation of teachers included:

- The instructor is prepared for each class
- The instructor demonstrates knowledge of the subject
- The instructor has completed the whole course
- The instructor provides additional material apart from the text book
- The instructor gives citations regarding current situations with reference to Pakistani context
- The instructor communicates the subject matter effectively
- The instructor shows respect towards student and encourage class participation
- The instructor maintains an environment that is conductive to learning
- The instructor arrives on time
- The instructor leaves on time
- The instructor was available during the specified office hours and for after class consultations
- The instructor is fair in examination The instructor returns the graded scripts etc in a reasonable amount of time.

The students response regarding each individual teacher was judged by a scale (A= Strongly Agree, B=Agree, C=Uncertain, D=Disagree, E=Strongly Disagree) and converted to % age marks for each teacher.

Data was collected and analyzed by using software SPSS version 14.0.

RESULTS

Two hundred questioners were distributed to the preclinical students at the end of their course. Out of 200 students, 184 students replied while 16 did not respond. Thus the response rate was 92%. Out of 184 students, 99(53.8%) were males and 85 (46.2%) were females.

Regarding hours distribution of different subsections of anatomy, 66.03% of students declared it too long for abdomen, pelvis/perineum, neuroanatomy and applied anatomy while 50.27% were of the view that it was too short for embryology and head & neck. For the rest of subsections, 50.11% of students declared the hour's distribution as adequate (table II).

Forty one percent of the respondents suggested that showing dissection movies, demonstrating through plastic models/ prosected specimens instead of doing cadaveric dissection can be valuable, while 40 % asked for both horizontal and vertical organization of the contents within different disciplines of anatomy and with other preclinical and clinical subjects. Moreover 20% were of the view to include clinically oriented topics and revision lectures on neuro-anatomy and systemic embryology.

FEEDBACK OF PRECLINICAL STUDENTS ABOUT THE HOUR'S DISTRIBUTION OF SUB-SECTIONS OF ANATOMY SUBJECT AT KIMS (n=184)

Subsections of Anatomy subject	Too long		Too short		Adequate	
	Frequency	%age	Frequency	%age	Frequency	%age
General anatomy	74	40.22	27	14.67	83	45.11
Thorax	74	40.22	24	13.04	86	46.74
Abdomen	136	73.91	18	9.78	30	16.31
Pelvis/Perineum	129	70.11	48	26.09	7	3.80
Extremities	28	15.21	55	29.89	101	54.89
Vertebral column/Back	64	34.79	24	13.04	96	52.17
Head and neck	74	40.22	92	50	18	9.78
Neuroanatomy	125	67.93	37	20.11	22	11.96
Applied anatomy	96	52.17	86	46.74	2	1.09
Embryology	17	9.24	93	50.54	74	40.22
Histology	46	25	52	28.26	86	46.74

Table II

ASSESSMENT OF INTERNAL EVALUATION SYSTEM BY STUDENTS

		A		B		C		D		E		Total	
		n	%age	n	%age	n	%age	n	%age	n	%age	n	%age
In the present system, whether the teachers are fair in-	Written	97	52.7	80	43.5	5	2.72	0	0	2	1.09	184	100
	Viva	70	38	60	32.6	19	10.3	17	9.24	18	9.78	184	100
	Assignment	49	26.6	69	37.5	42	22.8	10	5.43	14	7.61	184	100
	Verbal Questions in class	72	39.1	66	35.9	32	17.4	4	2.17	10	5.43	184	100
	Class presentations	52	28.3	54	29.3	46	25	18	9.78	14	7.61	184	100
In the present system, whether the facilities provided are sufficient:	Written	76	41.3	56	30.4	17	9.24	19	10.3	16	8.7	184	100
	Viva	53	28.8	59	32.1	29	15.8	19	10.3	24	13	184	100
	Assignment	35	19	44	23.9	63	34.2	19	10.3	23	12.5	184	100
	Verbal Questions in class	54	29.3	51	27.7	32	17.4	29	15.8	18	9.78	184	100
	Class presentations	32	17.4	36	19.6	64	34.8	23	12.5	29	15.8	184	100
In the present system, whether the time given is enough for:	Written	64	34.8	65	35.3	14	7.61	32	17.4	9	4.89	184	100
	Viva	65	35.3	79	42.9	16	8.7	18	9.78	6	3.26	184	100
	Assignment	40	21.7	69	37.5	44	23.9	28	15.2	3	1.63	184	100
	Verbal Questions in class	47	25.5	88	47.8	29	15.8	15	8.15	5	2.72	184	100
	Class presentations	51	27.7	73	39.7	40	21.7	14	7.61	6	3.26	184	100
In the present system, the number of questions asked are reasonable for:	Written	70	38	88	47.8	11	5.98	8	4.35	7	3.8	184	100
	Viva	53	28.8	98	53.3	15	8.15	13	7.07	5	2.72	184	100
	Assignment	42	22.8	70	38	51	27.7	11	5.98	10	5.43	184	100
	Verbal Questions in class	44	23.9	71	38.6	49	26.6	17	9.24	3	1.63	184	10
	Class presentations	42	22.8	68	37	52	28.3	12	6.52	10	5.43	184	100
In the present system, whether the questions asked are within the course outlines:	Written	75	40.8	56	30.4	23	12.5	21	11.4	9	4.89	184	100
	Viva	53	28.8	53	28.8	38	20.7	23	12.5	17	9.24	184	100
	Assignment	45	24.5	81	44	44	23.9	9	4.89	5	2.72	184	100
	Verbal Questions in class	40	21.7	84	45.7	40	21.7	16	8.7	4	2.17	184	100
	Class presentations	46	25	81	44	38	20.7	12	6.52	7	3.8	184	100
In the present system, are you satisfied with the internal evaluation procedure:	Written	69	37.5	73	39.7	26	14.1	12	6.52	4	2.17	184	100
	Viva	53	28.8	68	37	28	15.2	19	10.3	16	8.7	184	100
	Assignment	35	19	58	31.5	58	31.5	12	6.52	21	11.4	184	100
	Verbal Questions in class	52	28.3	57	31	38	20.7	20	10.9	17	9.24	184	100
	Class presentations	52	28.3	63	34.2	37	20.1	13	7.07	19	10.3	184	100

A: Strongly Agree B: Agree C: Uncertain D: Disagree E: Strongly Disagree

Table III

Details of assessment of internal evaluation system by students are shown in table III. Seventy three percent of the students agreed that teachers were fair in evaluation of students in examination and class tests while 69.64% of students were of the view that time given for evaluation was sufficient and 70.2% of the respondent's opined that the number of questions asked during evaluation were reasonable and were within the specified course. Overall internal evaluation system was satisfactory declared by 124 (67.40%) of students. However facilities provided to students for class presentation and assignments were declared not sufficient by 23.79% of the students.

Seven anatomy teachers were evaluated by students through QEC of KUST. The details of the individual teacher's performance were kept confidential by QEC and were only communicated to the respective teacher and administration for improvement. Weaknesses and strengths of the teachers were highlighted. Out of seven anatomy teachers evaluated by students, three teachers (42.8%) were given an average score of 85.59% and three teachers (42.8%) were given score of 78.32% showing their excellent performance. Only one teacher was ranked low by giving score of 64%. Overall students were satisfied with the teacher's performance in the class and also during the assessment process. Internal evaluation system was declared satisfactory by 124 (67.40%) students.

DISCUSSION

Human anatomy is the foundation of modern clinical medicine but is still awaiting its due status in modern basic medical sciences curriculum. Present decline of anatomy in undergraduate medical education has raised few questions regarding reduction in teaching hours, teaching faculty and dissection of cadavers along with teaching methodologies.[13]

Total time allocated for teaching anatomy has been under wide discussion especially with introduction of PBL. Teaching time has been reduced in many western medical schools in the last few decades. Despite the rapid expansion and advancement of medical research and introduction of new diagnostic and therapeutic technologies, basic anatomical knowledge is still the basis of effective patient management.[14,15] In order to equip the preclinical students with sound basic knowledge of anatomy many medical schools are adopting new modern teaching techniques with special emphasis on developing modern anatomy curricula[16] so it is customary that the suggestions of medical students at the end of their course should be included in order to improve the undergraduate medical curricula.[10,17]

In our study most of students declared the hour's distribution of subsections of anatomy as adequate while some of the students expressed dissatisfaction about the contents as the time allotted to teach those regions was either too short or too long. Most of the students declared internal evaluation system satisfactory and were also satisfied with the teacher's performance in the class and also during the assessment process. Similalarly most of the students suggested showing dissection movies, demonstrating through plastic models/ prosected specimens and integration of anatomy with other subjects.

When the student's opinion regarding course contents and hours distribution was critically analyzed, it was found that they were unsatisfied by the time allotted to most of the regions and wanted a more appropriate distribution. These findings are comparable to similar other international surveys.[11, 18] This underlines the need to revise the curriculum periodically. It was observed in the survey that embryology is given the least time so 50.54% of the students were of the opinion that the knowledge provided to them for this region was too limited. Abdomen including pelvis and perineum were allocated more hours therefore more than 70% of the students were dissatisfied and were of the opinion that these disciplines were being taught to them for too long. This fact is contrary to surveys done by others.[18,19] Here we suggest that some of the hours from aforesaid disciplines be reduced and should be allocated to embryology. Similarly, students also responded that the neuroanatomy course is too long for them because more than 35 hours are granted to this section of the subject and regarding head and neck 50 % of students thought that this portion of anatomy is taught to them was too short i.e. Total of 35 hours. These findings are again in conflict with other studies.[18,19] We speculate that the reason for this dissatisfaction is that teachers want to teach more topics in fewer hours. Therefore it correspondingly becomes difficult for the undergraduate students to digest this much material in less time. To rectify this problem we suggest that some of the hours from neuroanatomy be deducted and given to head and neck plus the course details of neuroanatomy should be briefed. Moreover, one interesting emerging finding was the students view about the "applied" anatomy, their opinion was that it was taught for too long which is contrary to international surveys[17,18] we speculate that it is because all the assistant professors teaching anatomy at KIMS are practicing surgeons, who may be overemphasizing on clinical aspects of the anatomy.

In our study 40% of the students asked for integration of anatomy with other preclinical and clinical subjects and this view of the students has been recommended and supported by various other researchers' too.[20,21,22,23] Historically, Anatomy is taught in first two preclinical years and there is very little exposure to it in later years of training thus imparting irrelevant and superficial knowledge.[20] Furthermore this trend causes difficulties to students in knowing how the various parts of the body function as a whole and burdens the clinical faculty too. So there is an immense need to integrate it vertically so that students are exposed to the subject in rest of the training years resulting in improvement in students attitudes toward basic knowledge of anatomy[21, 22] stimulate

profound learning[23] and gain equivalent competency in less time. In contrast to vertical integration, horizontal integration attempts to co-ordinate between various disciplines of anatomy as well as with other two basic subjects taught in first two years. It really helps in achieving better clinically oriented learning and high level of vertical integration.[14]

Conventionally, Cadaveric dissection has been regarded as an essential in learning gross anatomy but modern medical curricula has challenged this trend so that many medical students do graduation without ever doing dissection of human cadaver and yet appear to be equally competent. Descriptive papers and professional opinions are common, but scientific evidence of its supremacy is lacking.[24] Dissection of cadavers is costly, time consuming, create pressure on the timetable and has an emotional disturbing impact on some students.[18] Furthermore, the preserved dead bodies usually do not give a true impression of the living one, has a little role in gaining dexterity skills[25], their availability and related Islamic issues especially in our country are of serious concern too. No difference was found in the level of knowledge of anatomy between those who learnt through prosected specimens and those who dissected cadavers.[24] The role of dissection is limited as it is not the only learning method in acquinazation of knowledge of Anatomy so has been supervened upon by more advanced teaching tools. Moreover, cadaver dissection should be considered mandatory in training for postgraduate learning in anatomy.[16] So all the above facts have led to less dissection, greater use of prospected specimens, plastinated models, Chinese human data set[26], step by step human dissection videos and widespread use of internet based resources to learn anatomy.[18,19] In our study most of the students opined for other alternatives instead of doing cadaveric dissection like showing dissection movies, demonstration through plastic models/ prosected specimens and integration of anatomy with other subjects. Different researcher's surveys also support this view of the students.[14, 20-27]

Moreover 1/5 (20%) of the respondents asked for to include clinically oriented topics and revision lectures on neuro-anatomy and systemic embryology. It is assumed the students will benefit from knowing more gross anatomy of nervous system and systemic developmental anatomy by revision as repetition is the art of learning.

The content of the undergraduate curriculum at medical schools is a pulse throbbing issue and it tells the intellectual status of a nation. Curriculum has a definite influence on healthcare outcomes, however it is constantly being ignored and therefore there is a desperate need to develop a research program in this field.[24] The substance of curriculum should be based on those clinical problems that students will need to handle upon completion of their graduation. The content within a discipline should cater for those core clinical problems faced by the community. Students should be trained in such a way that they can fulfill future needs of community. The question which has to be answered is, "Are we really training our pupils to meet the future health demands of the community". In fact the efficiency and competency of the future young doctors can only be ensured by evaluating the curriculum contents, methods of teaching and realization of the aforesaid aims.

It is recommended that young doctors as well as specialists should be involved in such surveys in order to develop anatomy curricula for undergraduate and post graduate trainees. This study is only limited to the preclinical students and is the first ever attempt on the issue in our country. We feel that the data may not be representative of clinical students and any conclusions drawn from the data should be projected with caution as these are mere the personnel opinions and suggestions and not the measurable objective.

CONCLUSION

We conclude that most of the preclinical students were satisfied with the studied course contents because it was taught adequately. Data of the survey gives the impression that we should regularly reform and update the anatomy curriculum in order to generate competent young doctors to meet the future health demands of the nation.

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AUTHORSHIP

SAP: Acquisition of data, Drafting the manuscript

ASK: Conception, Acquisition of data

ZS: Analysis and Interpretation of data, Critical revision

KW: Design of study, Drafting the manuscript

CONFLICT OF INTEREST

Authors declare no conflict of interest

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